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Impact of combat stress on mental health outcomes, BRFSS survey data 2006

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Abstract

Objectives: This study sought to determine the relationship between combat experience and mental health outcomes. The study sought to determine whether age was a significant factor in poor mental health outcomes. *Methods:* Multiple logistic regression (n = 195,048) and multiple linear regression (n = 264,154) were performed on the 2006 Behavioral Risk Factor Surveillance System (BRFSS) survey. Veteran status and a host of demographic and health status questions were analyzed in relation to diagnosis of anxiety or depressive disorder (multiple logistic regression) and to number of days poor mental health (multiple linear regression). *Results:* Diagnosis of anxiety or depression was not found to be associated with veteran status. Among both veterans and non-veterans, diagnosis was associated with age <35 years, female gender, white race, unemployment, poor general health, poor physical health, and low levels of emotional support and life satisfaction. In veterans, diagnosis of anxiety or depression was associated with use of disability equipment. In non-veterans, diagnosis of anxiety or depression was associated with heavy drinkers. Greater days of poor mental health was found to be associated with non-veteran status (B = 0.323). Among both veterans and non-veterans, greater number of poor mental health days was associated with younger age, female gender, white race, unemployment, poor general health, poor physical health, low levels of emotional support or life satisfaction, and heavy drinkers. In veterans, greater days of poor mental health was associated with use of disability equipment. In non-veterans, greater days of poor mental health days associated with divorced, separated, or widowed marital status. *Conclusions:* Contrary to expectations, veteran status was found to be a protective factor for poor mental health outcomes in this analysis. Younger age was found to be associated with poor mental health outcomes, but was an equal association in both veterans and non-veterans, suggesting that mental health outcomes have not been worsened by recent changes in combat characteristics. Denial of mental health status, stoicism within the military community, and limitations of the survey are proposed to explain the unexpected outcome of this analysis.

Introduction

The individual and societal human costs associated with poor mental health are profound and well documented.¹ Financially, mental illness is a double burden, not only requiring great resources for successful treatment, but also cutting the productivity of those affected. Mental illness is an independent risk factor for physical illness, and patients with mental disorders have disproportionately high rates of chronic illness compared to the general population. Those in care for mental illness generally die younger than the general population,² and mental illnesses such as major depression often lead to suicide, the 11th most common cause of death in 2005.³ Further, mental illness is often responsible for damaging family networks and relationships, destabilizing the lives of close contacts of the mentally ill.⁴ An accurate understanding of a nation's mental health status is crucial to promoting general well-being, ensuring appropriate research investments, and advocating effectively for the mentally ill.⁵

Risk Factors for Mental Illness

Risk factors for mental illness include genetic predisposition, long-term exposure to stressful environments (e.g., dysfunctional family situations), and stressful personal experiences.^{6,7,8} The cognitive-relational theory developed by Lazarus and Folkman describes stress as a person's reaction to a situation in which the demands of the environment exceed the coping resources of the individual.⁹ The effects of environmental stressors are additive, and prolonged exposure to high levels of stress can have lasting harmful effects. For example, research has indicated that individuals who have had traumatic experiences suffer worse mental health outcomes than does the general population.^{10,11} However, a supportive social environment has been shown to mediate the degree of coping¹² and may influence mental health outcomes positively. Individual appraisal of the environmental demand as a positive challenge or one that is manageable also predicts successful coping.

Stressors and mental health in the military

The combat experience has long been associated with high levels of stress,¹³ and has been shown to result in long-term psychosocial damage in veterans.^{14,15} Mental health problems are consistently found to be among the most significant health issues for veteran populations.¹⁶ Research in this area has

focused on veteran access to mental health care services¹⁷, concurrent alcohol abuse, and post-traumatic stress disorder (PTSD),^{18,19} among other topics. PTSD as an outcome of outcomes following the combat experience of Vietnam veterans has been studied extensively. Specific combat experiences that have been linked to PTSD include “being shot at, handling dead bodies, knowing someone who was killed, or killing enemy combatants.”²⁰ At present, 15% of Vietnam veterans experience PTSD, in comparison to 3-4% of the general US population.²¹ A study published in November 2007 found that 20.3% of recent active-duty soldiers and 42.4% of recent reserve soldiers required mental health treatment.²² The authors suggest that the higher rate among reservists reflects a shorter period of care access, and better reflects the true rate of mental health illness among recent veterans. The mental health effects of the combat environment have clear long-term implications. Differences of poor mental health causation between veterans and non-veterans are not well-studied and may provide insight into the different stress pathways leading to mental health outcomes.

Global War on Terror

The present Global War on Terror (GWOT), encompassing wars in Afghanistan (Operation Enduring Freedom) and in Iraq (Operation Iraqi Freedom), has put great demands on the US military. Since the start of the campaign, approximately 1.5 million troops have been deployed, one-third of whom have been deployed at least twice, and 20,000 of whom have been deployed at least five times. As of 18 November 2007, 4,336 troops had been killed and 28,489 had returned with physical wounds and disabilities²³. Possible damage to mental health is a predictable result of physical trauma, emotional distress and long tours of duty, and some researchers have pointed to similarities of the GWOT to the Vietnam conflict in characterizing the rate of PTSD among recent veterans^{24,25}.

However, the GWOT differs from wars past. Amorphous battle objectives, civilian involvement (including contractors and bystanders), lengthy service tours, and lack of enemy clarity may be encountered more commonly by today’s soldiers. These features of the GWOT combined with advanced technological dependence, the concept of terror, and certain logistical difficulties²⁶, call into question the generalizability of Vietnam veteran research to the recent GWOT veteran population. Moreover, the

demographic background of the military has changed rapidly since the last prolonged US war. Now with an all-volunteer army, the rates of minority, female, and head of household military are on the rise,²⁷ and requirements on education, age, and criminal records are becoming more lax.²⁸ Research on the present generation of veterans is needed to evaluate the prevalence of mental health disorders and to inform our national response.

Existing research on mental health in today's military

Recent studies examining the mental health of the current military population have measured raw rates of diagnosed mental illness, but have not considered correlated factors. Kang et. al. reported increasing rates of mental illness among returning veterans throughout the year 2005; they found that for the year as a whole, 26% of recent veterans were at risk of possible mental disorders.²⁹ Hoge et al. have recently reported that "...in the military, mental disorders are the sixth leading illness category for ambulatory treatment, and frequently occur along with other medical conditions."³⁰ The most recent literature has examined specific questions about the accessibility of and barriers to mental health care,^{31,32} the changes in mental health status for veterans during their tour of duty,³³ and the differences between the mental health outcomes of Operation Enduring Freedom (Afghanistan) veterans and those of Operation Iraqi Freedom.^{34,35}

Available evidence warns of an impending need for extensive mental health services for recent veterans, and as such, it is very important to estimate the actual prevalence of the mental health issues they face. It is also necessary to determine whether specific risk and protective factors for mental illness operate similarly among members of this population as they do among older veterans. A February 2007 report on the psychological needs of U.S. military service members and their families written by the American Psychological Association and a Presidential Task Force listed a dearth of literature as the greatest limitation to the study.³⁶ Understanding the similarities and differences between different veteran populations will allow researchers to determine the applicability of older veteran research to the new population of veterans. Additionally, defining the veteran sub-populations most at risk for poor mental health outcomes will allow better targeting of interventions and educational campaigns.

Objectives

Although some strong research exists on the veteran population as a whole, there has been very little investigation of the predictors of poor mental health outcomes in the present generation of young veterans and military. The present study is an effort to address this information gap. Its specific aims are:

1. To use data from a national household survey to estimate the prevalence of mental health problems and potential demographic and general health risk and protective factors among veterans and non-veterans.
2. To examine associations between potential risk and protective factors and mental health status among veterans, and to compare such associations with those evident in the general population.
3. To determine whether veteran status, veteran age, or their interaction serve as independent risk factors for mental health problems when other factors are controlled.

Methodology

Participants

This study uses data from the Behavioral Risk Factor Surveillance System (BRFSS) survey. The BRFSS survey is conducted by the Centers for Disease Control and Prevention (CDC), and is designed to collect a representative sample of respondents for every US state, the District of Columbia, and the territories of Puerto Rico, Guam, and the Virgin Islands. The survey is intended to represent all non-institutionalized adults aged 18 or greater. The total number of volunteer participants in the 2006 BRFSS survey was 355,710.

For the first portion of the present analysis, the sample was restricted to participants providing a response to a question about the number of days in the last month on which they experienced poor mental health (n= 349,569). For the second portion of this analysis, the sample was restricted to participants from states that administered an optional depression and anxiety module (n= 195,048). Questions regarding diagnosis of an anxiety or depressive disorder garnered 186,852 responses. Thirty-

six locations participated in the anxiety and depression module, including Alabama, Alaska, Arkansas, California, Delaware, the District of Columbia, Florida, Georgia, Hawaii, Indiana, Iowa, Louisiana, Maine, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Mexico, North Dakota, Oklahoma, Oregon, Puerto Rico, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, the Virgin Islands, Virginia, West Virginia, Wisconsin, and Wyoming.

For all analyses performed in this study, the data were weighted according to CDC recommendations. The weighting procedures used reduce the effect of statistical assumptions that all records have an equal chance of being selected, and that the non-response rate is equal across all questions.

Instrument

The BRFSS is a telephone survey with closed-ended responses. The BRFSS uses random-digit dialing, and is based on a multistage cluster sampling design. In 2006, fifty-one locations used disproportionate stratified sampling, and thirty-eight locations used disproportionately sampled geographic strata to account for regional differences within the locality. Data collected for individual states was pooled to create a national dataset. In the 2006 survey, the response rates ranged from 35.1-66.0%, with a median response rate of 51.4%. On average, the survey takes volunteer respondents 10 minutes to complete. Questions for the BRFSS often come from other national surveys, including the National Health Interview Survey or the National Health and Nutrition Examination Survey, allowing the BRFSS to use questions that have previously been tested and the results of which may be compared against other surveys. All locations administer core sections of the BRFSS, and states may elect individually to include specific modules focusing on health factors of interest. In 2006, the BRFSS survey included 22 core sections (health status, healthy days and health-related quality of life, health care access, exercise, diabetes, oral health, cardiovascular disease prevalence, asthma, disability, tobacco use, demographics, veteran status, alcohol consumption, immunization and adult influenza, falls, seatbelt use, drinking and driving, women's health, prostate cancer screening, colorectal cancer screening, HIV/AIDS, and emotional support and life satisfaction) and 17 optional module sections (random child selection,

child influenza vaccination, childhood asthma prevalence, diabetes, visual impairment and eye care access, healthy days symptoms, adult asthma history, family planning, folic acid, secondhand smoke policy, indoor air quality, home environment, reactions to race, anxiety and depression, sexual violence, intimate partner violence, and general preparedness).

Dependent Measures

In this study, there were two measures of the outcome of poor mental health. The first was the BRFSS core question, “How many days during the past 30 days was your mental health not good?” Its response options ranged from zero to thirty days, and it was treated as a continuous variable in the present analysis. The number of complete responses available for use in this analysis was 264,154.

For the second outcome measure, responses to the two following BRFSS modular questions were combined to create a single outcome variable.

1. “Has a doctor or other healthcare provider EVER told you that you had an anxiety disorder (including acute stress disorder, anxiety, general anxiety disorder, obsessive-compulsive disorder, panic disorder, phobia, posttraumatic stress disorder, or social anxiety disorder)?”
2. “Has a doctor or other healthcare provider EVER told you that you have a depressive disorder (including depression, major depression, dysthymia, or minor depression)?”

Respondents answering “yes” to one or both questions were regarded to have a history of mental illness.

The number of responses available for use in this analysis was 195,048.

Independent Measures

Both demographic and health and well-being characteristics were included as independent variables in this analysis because they were potential confounders of the relationships among veteran status, age, and mental illness. Demographic variables included age, marital status, presence of children in the home, education level, employment status, income level, sex, race, and veteran status. Health and

well-being variables included general health status, days of poor physical health, the use of disability equipment, emotional support, life satisfaction, and alcohol abuse.

For analyses involving the continuous dependent variable, number of days of poor mental health, the variables of age, education level, income level, general health status, days of poor physical health, emotional support, and life satisfaction were treated as continuous variables. Sex, use of disability equipment, and veteran status, were dichotomous categorical variables in the original data set, and were treated as such in these analyses. The number of children in the home was collapsed into a dichotomous value to reflect the study's interest in the presence of any children in the home. A dichotomous "heavy drinker" variable was computed for use in these analyses and represents adult men having more than two drinks per day and adult women having more than one drink per day. Employment status and marital status were each collapsed to three-value categorical variables. The collapsing of employment status into currently employed, currently unemployed, and retired responses was based on associations of unemployment with increased stress and retirement with decreased stress.³⁷ The collapsing of marital status into married, never married, and divorced, separated, or widowed was based on the premise that divorce, separation, or widowing represents a stressful life event, while marriage can increase the level of available social support and social support, in turn, represents a potential mediator of stress.³⁸ The variable of race was categorized into four values: White Non-Hispanic, Black Non-Hispanic, Hispanic, and Other Race or Multiracial Non-Hispanic.

For the analyses involving the categorical dependent variable, diagnosis of an anxiety or depressive disorder, all independent variables were evaluated in categories. Sex, use of disability equipment, veteran status, employment status, marital status, and race were considered as in the first analysis. Age, general health status, number of poor physical health days, education, income, emotional support, and life satisfaction were collapsed into categories for analysis. Age was dichotomized into those younger and older than 35 years. Thirty-five years was chosen as a breakpoint to best estimate veterans participating in the GWOT (18-35 years old) and those participating in earlier conflicts (older than 35 years old)³⁹. General health status was analyzed according to original response values: excellent,

very good, good, fair, and poor. The number of poor physical health days was split into four categories: zero days, 1-10 days, 11-20 days, and 21-30 days. Education level was collapsed into four categories: less than a high school education, high school education, some college or technical school, and college graduate. Use of the less than high school education category collapsed several categories with small numbers of responses. Income level was evaluated by collapsing the eight original values into four, less than \$15,000, \$15,000-\$25,000, \$25,000-\$50,000, and \$50,000 or more. Emotional support was considered using its original five values: always, usually, sometimes, rarely, and never. Life satisfaction was likewise considered using its original four values: very satisfied, satisfied, dissatisfied, and very dissatisfied.

Statistical Analyses

Descriptive, bivariate and multivariate statistics were calculated for the continuous outcome variable, number of days of poor mental health. Background demographic and health status information were determined for all participants providing a response to all considered questions. For originally continuous variables (age, days of poor physical health, and days of poor mental health), means and standard errors are provided. For originally categorical variables (all other variables), the frequency and percentage of each response were calculated. The correlation of each variable with days of poor mental health was calculated to determine strength of association and to detect possible multiple multicollinearity. Interactions of both age and veteran status and gender and veteran status were calculated but found to be insignificant. Finally, multiple linear regression was used to determine the relationship between days of poor mental health and independent variables. Variables not demonstrating a significant relationship with the number of days of poor mental health were removed in a stepwise manner to achieve the best predictive model (p-value of the F-value > 0.05). Variable beta weights and p-values, and the overall regression coefficient are reported for the final regression model.

Descriptive, bivariate, and multivariate statistics were likewise calculated for the second outcome variable, diagnosis of anxiety or depressive disorder. Background demographic and health status information were determined for all participants providing a response to the question about having been diagnosed with anxiety or depression. The frequency and percentage of each categorical response value

was calculated. The prevalence of diagnosis of anxiety or depression was calculated for each demographic and health status variable. Unadjusted odds ratios were calculated for each variable, and interactions of both age and veteran status and gender and veteran status were calculated but found to be insignificant. Variables found to be significantly associated with the dependent variable were included in a multiple logistic regression model (p-value of the chi-square < 0.05). The odds ratios and confidence intervals of variables remaining in the final logistic model are reported.

Results

I. Logistic regression analysis of the dichotomous outcome: Diagnosis of anxiety or depression.

Participant characteristics

Table 1 provides background demographic and health status characteristics for the BRFSS module participants. Veteran status was reported by 19.49% of the sample; 79.89% of the sample reported non-veteran status. Background demographic and health characteristics of participating veterans and non-veterans are shown in table 1. Veterans in the sample were older than non-veterans (87.07% vs. 62.80% over 35 years old, respectively), and a higher percentage were male (93.14% vs. 41.89%, respectively). In comparison to non-veterans, higher percentages of veterans reported being married or having been married, having children in the home, and being retired. Veterans reported higher levels of education, and a higher income. A higher percentage of veterans were White Non-Hispanics, and fewer were Hispanic. The reports of veterans and non-veterans were similar regarding general health status, days of poor physical health, use of disability equipment, and level of alcohol use. Similarly, veterans and non-veterans reported similar levels of emotional support and life satisfaction. Non-veterans reported higher rates of diagnosis of a depressive or anxiety disorder (22.21% vs. 16.04%).

Prevalence of diagnosis

As seen in Table 2, the prevalence of depressive or anxiety disorder was highest among non-veterans (25.70%, vs. 10.79% in the veteran population). In comparing the veteran and non-veteran populations, similar diagnosis prevalence patterns were found for most variables. For both populations,

the highest rates were seen among those who were unemployed, had the lowest incomes, were female, used disability equipment, and heavy drinkers. Increasing prevalence of anxiety and depressive disorders was associated with decreasing general health status, increasing days of poor physical health, decreasing levels of emotional support, and decreasing levels of life satisfaction. For veterans and non-veterans, being married and being a college graduate were found to be associated with the lowest rates of anxiety or depression diagnosis.

Diagnosis prevalence patterns differed between the veteran and non-veteran populations when compared by the variables of age, children, and race. Among non-veterans, those older than 35 had a higher prevalence of diagnosis (22.66% vs. 20.89%); among veterans, those aged 18-35 had a higher prevalence of diagnosis (18.30% vs. 15.90%). Non-veterans with children had a slightly higher prevalence of diagnosis, while veterans with children had a lower prevalence. Although black veterans and non-veterans reported the lowest prevalence of diagnosis, among non-veterans, whites reported the highest rates of anxiety or depression diagnosis and among veterans, Hispanics and member of other racial groups reported the highest rates.

Logistic regression models

Logistic regression modeling found that veteran status, income, and presence of children in the home were not associated with diagnosis of anxiety or depression, so these variables were not included in the final logistic model (see Table 3). Older age (35 and older) was found to be a protective factor with an odds ratio of 0.88 in comparison with younger age (18-34). Females were more likely to report diagnosis (OR = 2.02), and minority status was found to be associated with reduced likelihood of anxiety or depression diagnosis. Increased education level (some college or college graduate) was found be associated with diagnosis of anxiety or depression (OR = 1.17, 1.14 respectively). Individuals divorced, separated, or widowed had a higher risk of diagnosis in comparison to those currently married or partnered (OR = 1.22). Retired employment status was associated with a lower risk of diagnosis (OR=0.76), while unemployed status was associated with a higher risk (OR = 1.43). Heavy drinkers were associated with a higher rate of diagnosis (OR = 1.28). Declining general health status, increasing days of

poor physical health, and use of disability equipment were associated with greater likelihood of diagnosis, as were decreasing levels of emotional support and decreasing levels of life satisfaction.

Separate logistic regression models for the veteran population and for the non-veteran population are also provided in Table 3. For both models, observed results for all variables were in the same direction, though not all relationships remained significant. For both models, college graduate status lost significance. For the veteran model, marital status, education level, use of disability equipment, and heavy alcohol consumption were removed from the model. Further, retired status, Hispanic or other/multiracial race, and poor health status were not found to be significantly associated with diagnosis of anxiety or depression.

II. Multiple linear regression analysis of continuous outcome: Number of poor mental health days.

Participant characteristics

The average age of survey participants supplying a number of poor mental health days was 44.94 years. Veterans were significantly older than non-veterans (56.42 vs. 43.19 years). The average number of poor physical health days for the total population was 2.81 of the last 30; the average number of poor mental health days was 3.01 days. For veterans, the average number of poor physical health days (3.38 days) was higher than the average number of poor mental health days (2.19 days). For non-veterans, the average number of poor physical health days (2.73 days) was lower than the average number of poor mental health days (3.13 days). Complete descriptions of the continuous variables considered are provided in Table 4. Table 4 also provides the frequencies of categorical data for the population as a whole and by veteran status. In general, the participants analyzed for the number of poor mental health days outcome were similar to the diagnosis of anxiety or depression outcome. Veterans were more likely to be male (93.11% vs. 43.05%, respectively). In comparison to non-veterans, veterans were more likely to be married or have been married, more likely to have children in the home, and more likely to be retired. Veterans tended to have a higher level of education, and a higher income. Veterans were more likely than non-veterans to be White Non-Hispanics, and less likely to be Hispanic. In regard to general health status, reported days of poor physical health, use of disability equipment, and level of alcohol use,

veterans and non-veterans reported similar experiences. Similarly, veterans and non-veterans reported similar levels of emotional support and life satisfaction.

Correlation with poor mental health days

The number of poor mental health days was most strongly correlated with level of life satisfaction ($r = 0.273$), level of emotional support ($r = 0.220$) and number of poor physical health days ($r = 0.213$). The correlation of number of poor mental health days and all considered variables is provided in Table 5. Evaluation of number of poor mental health days correlation with variables in the veteran and non-veteran groups specifically showed no significant difference in correlation pattern.

Linear regression models

Significant predictors in the final linear regression model for the entire population included veteran status, age, sex, general health status, days of poor physical health, emotional support, life satisfaction, divorced, separated, or widowed marital status, Black race, Hispanic ethnicity, unemployment, and heavy drinker status. Life satisfaction contributed the most to the model, and was positively correlated; the number of poor mental health days increased with worsening life satisfaction level ($\text{Beta} = 2.498$). Unemployed status was likewise positively correlated, and was associated with a greater number of days poor mental health ($\text{Beta} = 1.469$). Male sex was negatively correlated, such that female sex was associated with greater number of poor mental health days ($\text{Beta} = -1.234$). Complete information on the final model is provided in table 6. Non-veteran status, younger age, drinking heavily, worsening general health status, increasing number of days of poor physical health, lower levels of both emotional support and life satisfaction, and being divorced, separated, or widowed were found to be independently associated with number of days of poor mental health. Black non-Hispanic and Hispanic race were found to predict fewer days of poor mental health. The model as a whole had an r^2 of 0.1703, accounting for 17.03% of the total variance in number of poor mental health days reported. Similar results were found for the models run for the veterans and the non-veterans separately. For the veteran model, divorced, separated, or widowed marital status and Hispanic ethnicity were found to be not significantly associated with number of days poor mental health, but all other factors retained the same

relationship. The model as a whole had an r^2 of 0.1454, accounting for 14.54% of the total variance in number of poor mental health days reported. For the non-veteran model, other race non-Hispanic was found to be significantly associated with number of days poor mental health, in addition to all variables included in the entire population model. The model as a whole had an r^2 of 0.1734, accounting for 17.34% of the total variance in number of poor mental health days reported.

Discussion

Counter to the expectations of this investigator, neither of the measures of mental illness employed in the present study was positively associated with military experience. In fact, in unadjusted analyses of diagnosis of anxiety or depression and in adjusted and unadjusted analyses of number of days of poor mental health, veteran status was found to be a protective factor.

Not only were these findings consistent across dichotomous and continuous measures of mental health outcomes, the validity of the present results is supported by the fact that the two mental health outcome variables were complementary in several ways. Reports of clinical diagnoses indicate a history of serious mental illness but this measure does not necessarily capture or imply current impairment. Diagnoses may also be subject to more social stigma than number of days of poor mental health, and hence to reporting bias due to social desirability. By contrast, number of days of poor mental health is relatively subject to memory bias.

There are several possible explanations for the deviation of these findings from results expected on the basis of theory and previous research. Individuals are screened for physical and mental health problems before entering the military, and volunteers may self-select military service if they are more capable of handling stress than the general population. Veterans may have been socialized into a stoic culture that makes them feel particularly uncomfortable discussing mental health status, so they may underreport their symptoms. Differences in medical care between veterans and non-veterans may include less likely diagnosis of mental illness in veterans. Possibly, experience with high stress situations may make veterans better adapted to handling stress in daily civilian life, in comparison with non-

veterans. Compared with non-veterans, veterans may have appraised ordinarily stressful events as positive indications of progress towards military objectives, or reframed the events in some other protective way. Finally, higher rates of homelessness and institutionalization among severely mentally ill veterans may have skewed the outcomes of this study, as only households were included.

This study also sought to determine whether participation in the current GWOT resulted in higher rates of poor mental health outcomes in comparison to participation in previous US conflicts and wars. Again, contrary to expectations, these findings suggested that mental health outcomes are not different in veterans of the current GWOT. Rather, younger age was found to be a risk factor for poor mental health for all participants, and was not significantly stronger or weaker as risk factor for the veteran population. This trend may be a result of generational differences in exposure to stress, or may be reflective of recent trends in screening and mental health awareness.

When diagnosis prevalence was broken down by demographic variables, similar patterns were observed among veterans and non-veterans. Where differences occurred, relationships in the veteran population were not significant, and most likely reflect a less sizable sample.

Females were found to be more likely to experience poor mental health outcomes in all samples, indicating that women are at higher risk for mental illness. Contrary to previous research,⁴⁰ minority status was found in this study to be protective for mental illness. These findings may represent a bias among minorities in reporting mental health status to be better than it is, or may represent differential diagnosis and awareness of mental health between whites and minorities. Being divorced, separated, or widowed was found to increase the likelihood of poor mental health outcome in both analyses, while having never been married was not. This suggests that the experience of leaving a marriage may contribute significantly to lifetime stress, and thereby increase risk of mental illness. Higher education was found to be associated with a greater likelihood of diagnosis of anxiety or depression, but not with an increased number of poor mental health days. This discrepancy may reflect a greater rate of mental health screening during the college experience, or a higher rate of mental illness during the college years. Without information on when diagnosis of anxiety or depression was made, interpretation of this finding

is limited. Income was not found to be associated with mental health status by either analysis, but employment status was – suggesting that financial stability may be more important to mental health outcome than income level itself. Unemployment was very strongly predictive of poor mental health outcomes by both analyses – perhaps reflecting the effects of both financial stress and feelings of self-worth related to unemployment. Retired status was found to be significantly protective in the logistic analysis, but was found to be insignificant in the linear analysis. This difference may be potentially explained by the long lifetime of retirees, in which a mental health diagnosis may have been made, versus the recent mental health focus of the mental health days outcome. Heavy drinking was associated with a higher number of days of poor mental health, as well as with a diagnosis of anxiety or depression. This relationship supports the hypothesis that alcohol may be used in abuse as a means of coping with poor mental health.

The health variables of general health status and days of poor physical health were in general very predictive of mental health status and were largely consistent between veterans and non-veterans. For general health status, declining health status was directly related to worsening mental health outcomes. Logistic regression found a significant trend in odds ratios of declining status groups, and a significant beta-weight corroborated these findings in the linear regression. Similarly, increasing number of poor physical health days was found to be a risk for increasing number of poor mental health days in both analyses. This finding suggests that physical health status has a direct relationship with mental health outcomes, and that individual mental health is significantly influenced by one's physical health condition.

Strikingly, the use of disability equipment significantly increased the likelihood of poor mental health outcomes in veterans, but not in non-veterans or the general population. This trend was found in both analyses, and presents important findings. Veterans were more likely than non-veterans to use equipment for a disability, a trend that suggests combat-caused disability accounts for a significant percentage of disability among veterans. Such disabilities likely serve as a constant reminder of combat experiences and may increase the effect of such stressful memories on mental health outcomes.

Emotional support and life satisfaction served to indicate social health status. In both analyses, declining social health (decreasing degrees of emotional support and decreasing levels of life satisfaction) were found to be significantly associated with poorer mental health outcomes. Emotional support trends consistently revealed an interesting trend. As reported support levels declined from “Always” to “Rarely”, the associated mental health outcome declined significantly. However, among those reporting “Never”, the odds of a poor mental health outcome were generally low, and were less than those reporting “Usually”. This trend suggests that participants reporting never having emotional support may be secure in that reality and unaffected mentally. Importantly, this trend dilutes the significance of emotional support in the linear regression model and underestimates the strength of influence emotional support has on mental health outcome.

Life satisfaction was found to be the strongest predictor of mental health outcome. This is not a surprising outcome, as feelings of life satisfaction are closely tied with mental health by definition. However, the correlation between the two variables ($r = 0.273$ for the total sample) does not suggest that the two variables measure the same event. Rather, level of life satisfaction serves as the strongest predictor of poor mental health outcome in both analyses.

Several limitations of the measures and design employed in this study suggest caution in interpreting its results. Because the study used the BRFSS survey, a secondary data source, questions were not designed specifically to test the question at hand. Most significantly, the survey does not provide any further information on veteran status past defining whether one is a veteran or not. Information on when one saw service, the location and length of military service, and position in the military would all provide valuable information in answering the questions posed by this survey. Detailed information on the experience of combat and the perception of stress would likewise serve to elucidate the question at hand. Similarly, several variables are limited in their capacity to measure stressful impact. Questions on marital status do not account for previous marriages or marital quality. No question asks participants about lifetime income levels, their childhood experience, or the stability of their employment. Further details on these variables would be useful in better defining stressful co-

factors. In consideration of findings on equipment-requiring disability, the question refers to a wide spectrum of disability equipment, and does not distinguish between disabilities present from birth and those caused during the lifespan. The ability to identify disability specifically caused by combat experience would clarify the relationship between veterans, disability, and mental health. Finally, the survey does not provide information on family history of mental illness, an important consideration when examining causes of poor mental health.

The multiple-choice questionnaire format limited the information gathered and reduces the capacity to draw conclusions. For example, participants report their income by selecting a range, rather than by providing an exact number. This reduces the ability to examine income as a truly linear variable, and may limit the conclusions that may be drawn.

General shortcomings of the BRFSS survey have been well-documented. The survey is landline telephone based, and faces an inherent bias because the likelihood of having a landline phone is not equal across socio-economic and age groups. Significantly, the results of the survey are based completely on self-report. Research has found that underreporting of socially taboo characteristics, such as poor mental health, may present a problem in self-reported data.

Finally, as mentioned above, the BRFSS survey is designed to capture information on the general de-institutionalized United States population. Individuals currently in correctional facilities, group homes, or health facilities – including mental health facilities – are not included in the sample. Rather, the survey is designed to be representative of the general population. Individuals with extreme mental health problems are frequently displaced from conventional living environments and live on the streets or in mental health facilities.

Conclusions

The current political climate and the significant stress placed on today's military make the question of veteran mental health important and timely. The mental health outcomes of Vietnam veterans are largely responsible for the policies guiding present mental health care of combat veterans.

Research has found that use of mental health care among veterans is low, and strongly suggests that social stigma surrounding mental health issues is responsible.⁴¹ Despite the clear importance of mental illness among veterans, many studies have focused solely on the physical health conditions of veterans and neglected mental health altogether.⁴² Serious consideration of the mental health impacts of combat on today's military is necessary if the best care is to be given to veterans.

Despite the overall findings of the present study, young veterans of the GWOT may be at greater risk for poor mental health outcomes. The present data did suggest that the impact of disability disproportionately affects the mental health outcomes of veterans in comparison to non-veterans. Further research is necessary to determine the true mental health status of today's recent veterans. Studies that not only detail the personal combat experience of veterans but also probe their appraisal of the experience and that use mental health measures that are robust in the face of reporting bias would be very useful. The mental health issues faced by veterans can have long-term health impacts. Studies offering insight into the extent and causes of poor mental health outcomes will be invaluable in identifying service needs among returning veterans and crafting appropriate and humane social policies in this area. As the number of veterans grows, the need for such information becomes ever more pressing and timely.

Table 1: Background demographic and health status characteristics of 2006 BRFSS mental health module participants, in total and by veteran status

	Total Mental Health Module Participants (n = 195,048)		Veterans (n = 27,816)		Non-Veterans (n = 165,999)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Diagnosis of anxiety or depression						
Yes	41,364	19.49	4,462	16.04	36,874	22.21
No	143,496	79.89	22,075	79.36	121,274	73.06
Veteran status						
Veteran	27,816	13.04				
Non-veteran	165,999	85.68				
Age						
18-34 Years	35,137	33.42	1,842	12.40	33,099	36.68
35+ Years	158,166	66.03	25,819	87.07	131,377	62.80
Sex						
Male	74,584	48.76	25,491	93.14	48,529	41.89
Female	120,464	51.24	2,325	6.86	117,470	58.11
Race						
White Non-Hispanic	146,032	65.47	22,406	75.13	122,946	64.50
Black Non-Hispanic	17,956	9.37	1,981	9.34	15,789	9.33
Hispanic	16,589	17.75	1,258	7.89	15,160	18.87
Other/Multiracial	12,290	6.60	1,788	6.33	10,386	6.61
Marital Status						
Married or partnered	112,571	64.04	18,212	74.09	93,727	62.55
Never married	24,669	17.88	1,992	7.20	22,490	19.57
Divorced, separated, widowed	56,996	17.69	7,529	18.48	49,143	17.60
Children						
Yes	131,052	56.52	22,695	74.05	107,614	54.15
No	63,530	42.90	5,084	25.80	58,088	45.61
Education Level						
Less than high school	21,807	13.40	1,996	6.20	19,624	14.48
High school education	59,539	28.80	8,197	27.05	50,979	29.10
Some college or technical school	51,415	26.32	8,199	32.06	43,001	25.68
College graduate	61,732	30.92	9,381	34.44	52,041	30.57
Employment Status						
Employed, student, homemaker	128,732	73.32	13,300	53.84	114,741	76.63
Unemployed, unable to work	7,337	5.04	736	3.57	6,562	5.29
Retired	45,890	15.81	12,102	37.14	33,536	12.62
Income Level						
Less than \$15,000	21,676	10.10	2,105	5.96	19,466	10.76
\$15,000-\$25,000	29,835	14.48	3,980	12.76	25,706	14.82
\$25,000-\$50,000	50,129	24.14	8,217	28.25	41,719	23.73
More than \$50,000	66,573	37.88	10,438	42.88	55,942	37.47
Heavy alcohol consumption						
Yes	8,789	4.79	1,421	4.87	7,363	4.85
No	180,625	91.78	25,583	92.21	154,859	92.97

Continued on next page

Table 1: Background demographic and health status characteristics of 2006 BRFSS mental health module participants, in total and by veteran status (Continued)

	Total Mental Health Module Participants (n = 195,045)		Veterans (n = 27,516)		Non-Veterans (n = 165,999)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
General Health						
Excellent	36,840	20.77	4,812	19.69	31,781	20.94
Very Good	60,887	31.73	8,156	30.47	52,437	32.10
Good	59,200	30.15	8,832	30.76	49,961	30.01
Fair	26,045	12.49	3,972	12.66	21,889	12.42
Poor	11,356	4.59	1,948	6.18	9,349	4.26
Days Poor Physical Health						
0	121,317	63.28	18,066	65.24	102,474	62.99
1-10	44,009	24.09	5,264	20.30	38,515	24.68
11-20	8,521	4.10	1,115	3.73	7,355	4.15
21-30	17,249	7.01	2,879	9.33	14,247	6.64
Use of equipment						
Yes	18,164	7.14	3,367	12.10	14,689	8.85
No	176,749	92.86	24,424	87.81	151,211	91.09
Emotional Support						
Always	93,773	47.00	14,340	52.20	79,337	46.85
Usually	53,704	26.86	6,363	24.12	47,309	27.65
Sometimes	21,637	11.34	2,557	9.09	19,058	11.85
Rarely	6,312	3.49	918	2.91	5,387	3.63
Never	9,713	4.81	2,011	6.14	7,683	4.67
Life Satisfaction						
Very Satisfied	87,236	43.60	13,231	48.15	73,920	43.51
Satisfied	90,447	46.03	12,320	43.61	78,033	47.03
Dissatisfied	7,835	3.88	1,030	3.62	6,814	3.97
Very Dissatisfied	1,934	0.88	265	0.85	1,668	0.90

Table 2 History of anxiety or depression diagnosis among veterans and non-veterans, by background demographic and health status, variables, 2006 BRFSS mental health module participants

	Total Mental Health Module Participants				Veterans				Non-Veterans			
	Total N	Yes N	% (95%CI)		Total N	Yes N	% (95%CI)		Total N	Yes N	% (95%CI)	
Veteran												
Veteran	41,364	4,462	10.79	(10.49, 11.09)								
Non-veteran	143,496	36,874	25.70	(25.47, 25.92)								
Age												
18-34 Years	35,137	7,256	20.65	(20.23, 21.08)	1,942	337	15.30	(14.57, 20.15)	33,099	6,916	20.89	(20.46, 21.34)
35+ Years	150,166	30,900	21.43	(21.23, 21.64)	25,019	4,105	15.90	(15.46, 16.35)	125,377	29,772	22.66	(22.44, 22.89)
Sex												
Male	74,564	10,860	14.56	(14.31, 14.82)	25,491	3,530	15.02	(14.59, 15.47)	48,529	7,014	14.45	(14.14, 14.77)
Female	120,464	30,304	25.32	(25.04, 25.57)	1,325	632	27.18	(25.39, 29.05)	117,470	29,860	25.42	(25.17, 25.67)
Race												
White Non-Hispanic	146,032	32,793	22.46	(22.24, 22.67)	21,406	3,553	15.99	(15.51, 16.48)	122,946	29,191	23.74	(23.51, 23.98)
Black Non-Hispanic	17,956	2,614	14.56	(14.05, 15.08)	1,981	246	12.42	(11.01, 13.97)	15,789	2,367	14.99	(14.44, 15.56)
Hispanic	16,586	3,256	19.63	(19.03, 20.24)	1,258	235	18.68	(16.59, 20.97)	15,160	3,016	19.89	(19.26, 20.54)
Other/Multiracial	12,290	2,357	19.18	(18.49, 19.89)	1,788	335	18.74	(16.97, 20.64)	10,366	2,022	19.47	(18.71, 20.25)
Marital Status												
Married or partnered	112,571	20,996	18.65	(18.42, 18.88)	18,212	2,517	13.82	(13.32, 14.33)	93,727	18,464	19.70	(19.45, 19.96)
Never married	24,669	5,293	21.46	(20.95, 21.97)	1,992	360	19.08	(17.39, 20.89)	22,490	4,909	21.83	(21.29, 22.37)
Divorced, separated, widowed	36,996	14,693	26.20	(25.84, 26.56)	7,829	1,547	20.88	(19.44, 21.48)	49,143	13,379	27.22	(26.83, 27.62)
Children												
Yes	131,052	27,708	21.14	(20.92, 21.37)	21,695	3,541	15.60	(15.13, 16.08)	107,614	24,151	22.44	(22.19, 22.69)
No	63,530	13,612	21.43	(21.11, 21.75)	5,064	915	18.06	(17.01, 19.15)	58,088	12,694	21.84	(21.50, 22.17)
Education Level												
Less than high school	21,507	5,011	22.96	(22.42, 23.50)	1,996	332	16.63	(15.04, 18.36)	19,624	4,674	23.82	(23.22, 24.42)
High school education	59,539	12,405	20.84	(20.51, 21.16)	8,197	1,300	15.86	(15.08, 16.67)	50,979	11,096	21.77	(21.41, 22.13)
Some college or technical school	51,415	11,945	23.23	(22.87, 23.60)	8,199	1,450	18.05	(17.23, 18.90)	43,001	10,458	24.32	(23.92, 24.73)
College graduate	61,732	11,949	19.36	(19.05, 19.67)	9,381	1,344	14.33	(13.63, 15.06)	52,041	10,599	20.37	(20.01, 20.72)
Employment Status												
Employed, student, homemaker	128,732	25,177	19.56	(19.34, 19.78)	13,300	1,857	14.19	(13.60, 14.80)	114,741	23,275	20.28	(20.05, 20.52)
Unemployed, unable to work	7,337	2,376	32.38	(31.32, 33.47)	736	211	28.67	(25.45, 32.11)	6,562	2,164	32.98	(31.84, 34.13)
Retired	45,890	7,279	15.86	(15.53, 16.20)	11,102	1,510	12.48	(11.90, 13.08)	33,836	5,768	17.19	(16.79, 17.60)
Income Level												
Less than \$15,000	21,676	7,060	32.57	(31.95, 33.20)	1,105	613	29.12	(27.20, 31.12)	19,466	6,445	33.11	(32.45, 33.78)
\$15,000-\$25,000	29,835	7,120	24.20	(23.72, 24.69)	3,980	806	20.30	(19.07, 21.57)	25,706	6,407	24.92	(24.40, 25.46)
\$25,000-\$50,000	50,129	10,454	20.91	(20.54, 21.27)	8,217	1,344	16.36	(15.57, 17.18)	41,719	9,137	21.90	(21.51, 22.30)
More than \$50,000	66,573	12,100	18.18	(17.84, 18.47)	10,438	1,333	12.77	(12.14, 13.43)	55,942	10,761	19.24	(18.91, 19.57)

Continue on next page

Table 2: History of anxiety or depression diagnosis among veterans and non-veterans, by background demographic and health status, variables, 2006 BRFSS mental health module participants (Continued)

	Total Mental Health Module Participants			Veterans				Non-Veterans			
	Total N	Yes N	% (95%CI)	Total N	Yes N	% (95%CI)		Total N	Yes N	% (95%CI)	
Heavy alcohol consumption											
Yes	8,789	2,096	23.85 (22.96, 24.76)	1,421	235	16.54 (14.66, 18.60)		7,363	1,861	25.28 (24.29, 26.29)	
No	180,625	38,628	21.39 (21.20, 21.58)	25,583	4,140	16.18 (15.73, 16.64)		154,899	34,464	22.26 (22.05, 22.46)	
General Health											
Excellent	36,840	4,579	12.43 (12.10, 12.77)	4,812	438	9.10 (8.31, 9.96)		31,781	4,139	13.02 (12.66, 13.40)	
Very Good	60,887	10,907	17.91 (17.61, 18.22)	8,156	979	12.00 (11.31, 12.73)		52,437	9,924	18.93 (18.59, 19.26)	
Good	59,200	12,720	21.49 (21.16, 21.82)	8,832	1,378	15.60 (14.85, 16.38)		49,961	11,335	22.69 (22.32, 23.06)	
Fair	26,045	8,155	31.31 (30.75, 31.88)	3,972	970	24.42 (23.10, 25.79)		21,889	7,175	32.78 (32.16, 33.41)	
Poor	11,366	4,867	42.75 (41.83, 43.66)	1,946	683	35.06 (32.95, 37.23)		9,349	4,179	44.70 (43.69, 45.72)	
Days Physical Healthnot Good											
0	121,317	18,475	15.23 (15.03, 15.43)	18,066	1,981	10.97 (10.52, 11.43)		102,474	16,483	16.09 (15.86, 16.31)	
1-10	44,009	11,920	27.09 (26.67, 27.50)	5,264	1,091	20.73 (19.64, 21.85)		38,515	10,822	28.10 (27.65, 28.55)	
11-20	8,521	3,251	38.15 (37.12, 39.20)	1,115	382	34.27 (28.86, 34.40)		7,355	2,868	39.14 (38.28, 40.53)	
21-30	17,249	6,845	39.68 (38.95, 40.42)	2,879	981	33.93 (31.32, 34.79)		14,247	5,887	41.32 (40.51, 42.14)	
Use of equipment											
Yes	18,164	6,366	35.05 (34.35, 35.75)	3,367	1,047	31.10 (29.54, 32.70)		14,689	5,312	36.16 (35.39, 36.95)	
No	176,749	34,966	19.78 (19.60, 19.97)	24,424	3,412	13.97 (13.54, 14.41)		151,211	31,534	20.85 (20.65, 21.06)	
Emotional Support											
Always	93,773	14,431	15.39 (15.16, 15.62)	14,340	1,695	11.82 (11.30, 12.36)		79,337	12,727	16.04 (15.79, 16.30)	
Usually	53,704	13,853	25.80 (25.43, 26.17)	6,363	1,296	20.37 (19.39, 21.38)		47,309	12,552	26.53 (26.13, 26.93)	
Rarely	6,312	2,828	44.80 (43.57, 46.04)	915	320	34.96 (31.79, 38.05)		5,387	2,506	46.52 (45.18, 47.86)	
Never	9,713	1,772	18.24 (17.48, 19.03)	2,011	299	14.87 (13.36, 16.52)		7,683	1,471	19.15 (18.28, 20.05)	
Life Satisfaction											
Very Satisfied	87,238	11,766	13.49 (13.26, 13.72)	13,231	1,293	9.77 (9.27, 10.29)		73,920	10,465	14.16 (13.91, 14.41)	
Satisfied	90,447	23,367	25.84 (25.55, 26.12)	12,320	2,427	19.70 (19.00, 20.42)		78,033	20,926	26.82 (26.51, 27.13)	
Dissatisfied	7,855	4,468	56.88 (55.78, 57.98)	1,030	527	51.17 (48.07, 54.26)		6,814	3,936	57.76 (56.58, 58.94)	
Very Dissatisfied	1,934	1,251	64.68 (62.50, 66.81)	265	153	57.74 (51.53, 63.71)		1,666	1,097	65.85 (63.50, 68.11)	

Table 3: Crude and adjusted odds ratios of diagnosis of anxiety or depression among ERFSS participants

	Total Sample			Veterans			Non-Veterans		
	Unadjusted	Adjusted		Unadjusted	Adjusted		Unadjusted	Adjusted	
	OR	OR*	(95%CI)	OR	OR*	(95%CI)	OR	OR*	(95%CI)
Veteran status									
Veteran	1.00	1.00							
Non-veteran	1.38	0.93	(0.85, 1.01)						
Age									
18-34 Years	1.00	1.00		1.00	1.00		1.00	1.00	
35+ Years	0.63	0.88	(0.83, 0.95)	0.81	0.74	(0.57, 0.97)	1.14	0.90	(0.84, 0.97)
Sex									
Male	1.00	1.00		1.00	1.00		1.00	1.00	
Female	1.96	2.02	(1.89, 2.15)	2.04	2.05	(1.67, 2.51)	1.97	2.01	(1.88, 2.15)
Race									
White Non-Hispanic	1.00	1.00		1.00	1.00		1.00	1.00	
Black Non-Hispanic	0.61	0.43	(0.39, 0.47)	0.78	0.57	(0.44, 0.75)	0.58	0.41	(0.37, 0.46)
Hispanic	0.70	0.61	(0.55, 0.67)	0.93	0.83	(0.63, 1.10)	0.66	0.59	(0.53, 0.65)
Other/Multiracial	0.85	0.72	(0.62, 0.83)	1.61	1.18	(0.88, 1.57)	0.77	0.66	(0.57, 0.78)
Marital Status									
Married or partnered	1.00	1.00		1.00			1.00	1.00	
Never married	1.14	1.03	(0.94, 1.13)	1.57			1.08	1.03	(0.94, 1.13)
Divorced, separated, widowed	1.70	1.22	(1.14, 1.30)	1.65			1.70	1.25	(1.16, 1.34)
Children									
None	1.00			1.00			1.00		
One or more	1.06			1.15			0.67		
Education Level									
Less than high school	1.00	1.00		1.00			1.00	1.00	
High school education	0.89	1.06	(0.95, 1.17)	0.85			1.00	1.05	(0.94, 1.17)
Some college or technical school	1.05	1.17	(1.05, 1.31)	0.95			1.09	1.15	(1.02, 1.29)
College graduate	0.87	1.14	(1.01, 1.28)	0.71			0.86	1.12	(0.99, 1.27)
Employment Status									
Employed, student, homemaker	1.00	1.00		1.00	1.00		1.00	1.00	
Unemployed, unable to work	1.85	1.43	(1.25, 1.64)	2.68	1.78	(1.17, 2.72)	1.78	1.40	(1.21, 1.61)
Retired	0.85	0.76	(0.70, 0.81)	0.89	0.92	(0.77, 1.09)	0.93	0.74	(0.68, 0.80)

*All variables significant in unadjusted odds ratios included in adjusted logistic model

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Table 3: Crude and adjusted odds ratios of diagnosis of anxiety or depression among BRFSS participants (Continued)

	Total Sample			Veterans			Non-Veterans		
	Adjusted			Unadjusted	Adjusted		Unadjusted	Adjusted	
	OR	OR	(95%CI)	OR	OR	(95%CI)	OR	OR	(95%CI)
Income Level									
Less than \$15,000	1.00	1.00		1.00	1.00		1.00	1.00	
\$15,000-\$25,000	0.74	1.00	(0.90, 1.11)	0.51	0.92	(0.70, 1.21)	0.77	0.99	(0.88, 1.11)
\$25,000-\$50,000	0.63	1.05	(0.94, 1.17)	0.40	0.98	(0.74, 1.30)	0.67	1.04	(0.92, 1.17)
More than \$50,000	0.54	1.10	(0.98, 1.25)	0.30	0.94	(0.70, 1.25)	0.59	1.12	(0.98, 1.27)
Heavy alcohol consumption									
No	1.00	1.00		1.00			1.00	1.00	
Yes	1.31	1.28	(1.13, 1.44)	0.95			1.36	1.32	(1.16, 1.51)
General Health									
Excellent	1.00	1.00		1.00	1.00		1.00	1.00	
Very Good	1.48	1.24	(1.15, 1.35)	1.28	1.19	(0.95, 1.49)	1.50	1.25	(1.15, 1.37)
Good	1.89	1.48	(1.36, 1.61)	1.89	1.45	(1.16, 1.81)	1.90	1.49	(1.37, 1.63)
Fair	3.05	1.85	(1.66, 2.06)	3.07	1.44	(1.09, 1.90)	3.07	1.91	(1.70, 2.15)
Poor	5.46	1.82	(1.55, 2.13)	5.46	1.20	(0.86, 1.69)	5.62	1.95	(1.64, 2.32)
Days Physical Health not Good									
0	1.00	1.00		1.00	1.00		1.00	1.00	
1-10	1.97	1.51	(1.42, 1.61)	1.92	1.42	(1.15, 1.74)	1.96	1.53	(1.43, 1.64)
11-20	3.36	1.75	(1.55, 1.97)	4.24	2.09	(1.53, 2.84)	3.26	1.73	(1.52, 1.96)
21-30	3.88	1.77	(1.59, 1.98)	4.34	1.91	(1.51, 2.41)	3.89	1.77	(1.57, 2.00)
Use of equipment									
No	1.00	1.00		1.00	1.00		1.00		
Yes	2.37	1.17	(1.06, 1.29)	3.10	1.59	(1.20, 2.09)	2.33		
Emotional Support									
Always	1.00	1.00		1.00	1.00		1.00	1.00	
Usually	1.83	1.47	(1.38, 1.56)	1.74	1.38	(1.16, 1.66)	1.83	1.47	(1.38, 1.57)
Sometimes	3.01	1.95	(1.78, 2.13)	3.09	1.90	(1.55, 2.33)	2.97	1.95	(1.76, 2.15)
Rarely	3.80	1.99	(1.73, 2.29)	4.11	1.85	(1.27, 2.71)	3.73	2.00	(1.72, 2.33)
Never	1.33	1.01	(0.86, 1.19)	1.64	1.05	(0.77, 1.43)	1.29	1.00	(0.84, 1.19)
Life Satisfaction									
Very Satisfied	1.00	1.00		1.00	1.00		1.00	1.00	
Satisfied	2.10	1.55	(1.46, 1.65)	2.08	1.44	(1.23, 1.67)	2.10	1.57	(1.47, 1.68)
Dissatisfied	8.00	3.92	(3.45, 4.45)	9.67	3.91	(2.92, 5.25)	7.78	3.96	(3.44, 4.56)
Very Dissatisfied	10.25	4.68	(3.66, 6.00)	12.91	4.22	(2.22, 8.02)	9.91	4.81	(3.69, 6.27)

*All variables significant in unadjusted odds ratios included in adjusted logistic model

Table 4a: Age and health status characteristics of complete 2006 BRFSS participants

	Complete Participants (n = 264,154)		Veterans (n = 38,691)		Non-Veterans (n = 225,463)	
	Mean	SE	Mean	SE	Mean	SE
Days of poor mental health	3.01	0.030	2.19	0.07	3.13	0.03
Age	44.94	0.077	56.42	0.20	43.19	0.08
Days of poor physical health	2.81	0.030	3.38	0.08	2.73	0.03

Table 4b: Veteran status, demographics, and health status characteristics of complete 2006 BRFSS participants

	Complete Participants (n = 264,154)		Veterans (n = 38,691)		Non-Veterans (n = 225,463)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Veteran status						
Veteran	38,691	13.25				
Non-veteran	225,463	86.75				
Sex						
Male	104,175	49.68	35,458	93.11	68,717	43.05
Female	159,979	50.32	3,233	6.89	156,746	56.95
Race						
White Non-Hispanic	211,415	71.18	32,911	79.54	178,504	69.90
Black Non-Hispanic	19,826	8.62	2,396	8.39	17,430	8.65
Hispanic	18,802	14.10	1,400	6.52	17,402	15.26
Other/Multiracial	14,111	6.11	1,984	5.56	12,127	6.19
Marital Status						
Married or partnered	161,066	66.83	25,986	75.16	135,080	65.56
Never married	32,954	17.20	2,761	7.47	30,193	18.68
Divorced, separated, widowed	70,134	15.97	9,944	17.37	60,190	15.76
Children						
Yes	171,126	55.38	31,246	73.04	139,880	52.69
No	93,028	44.62	7,445	26.96	85,583	47.31
Education level						
Less than high school	20,589	9.47	2,231	4.84	18,358	10.17
High school education	75,829	27.41	11,084	27.54	64,745	27.39
Some college or technical school	71,532	27.15	11,368	31.58	60,164	26.47
College graduate	96,204	35.98	14,008	36.04	82,196	35.97
Employment Status						
Employed, student, homemaker	193,858	80.23	20,430	59.89	173,428	83.33
Unemployed, unable to work	10,427	4.90	1,085	3.49	9,342	5.12
Retired	59,869	14.87	17,176	36.63	42,693	11.55
Income level						
Less than \$15,000	23,533	8.17	2,241	4.44	21,292	8.74
\$15,000-\$25,000	42,783	14.95	5,710	12.71	37,073	15.29
\$25,000-\$50,000	80,584	28.15	13,137	31.60	67,447	27.62
More than \$50,000	117,254	48.73	17,603	51.25	99,651	48.34
Heavy alcohol consumption						
Yes	16,163	4.67	2,027	5.26	10,850	5.40
No	244,126	95.33	35,930	94.74	211,482	94.60
General Health						
Excellent	55,453	22.32	7,078	20.38	48,375	22.61
Very good	92,606	35.33	12,566	33.25	80,040	35.64
Good	79,920	30.03	12,471	31.82	67,449	29.76
Fair	28,116	10.01	4,841	10.80	23,275	9.89
Poor	8,059	2.32	1,735	3.74	6,324	2.10
Use of equipment						
Yes	16,358	4.65	3,543	8.40	12,815	4.08
No	247,796	95.35	35,148	91.60	212,648	95.92

Continued on next page

Table 4b: Veteran status, demographics, and health status characteristics of complete 2006 BRFSS participants (Continued)

				Veterans (n = 38,691)		Non-Veterans (n = 225,463)	
				Frequency	Percent	Frequency	Percent
Emotional support							
Always	132,932	49.95		21,165	55.40	111,767	49.12
Usually	83,599	31.23		9,961	26.66	73,638	31.93
Sometimes	28,263	11.14		3,559	9.22	24,704	11.44
Rarely	7,641	3.18		1,222	2.68	6,419	3.26
Never	11,719	4.50		2,784	6.04	8,935	4.26
Life satisfaction							
Very satisfied	126,967	47.29		19,710	51.40	107,257	46.66
Satisfied	126,544	48.73		17,533	44.97	109,011	49.30
Dissatisfied	8,852	3.32		1,194	3.08	7,658	3.36
Very dissatisfied	1,791	0.66		254	0.55	1,537	0.67

Table 5: Correlation of background demographic and health status variables with number of poor mental health days, BRFSS 2006

	Complete Participants (n = 264,154)		Veterans (n = 38,691)		Non-Veterans (n = 225,463)	
	r*	P-value	r	P-value	r	P-value
Number of poor mental health days	1.000		1.000		1.000	
Non-veteran status	0.045	<.0001				
Increasing age	-0.091	<.0001	-0.089	<.0001	-0.082	<.0001
Male gender	0.096	<.0001	0.080	<.0001	0.073	<.0001
Race						
Black Non-Hispanic	-0.016	<.0001	-0.007	0.193	-0.017	<.0001
Hispanic	-0.017	<.0001	-0.028	<.0001	-0.014	<.0001
Other Race or Multiracial	-0.021	<.0001	-0.038	<.0001	-0.018	<.0001
Marital status						
Never married	-0.044	<.0001	-0.031	<.0001	-0.042	<.0001
Divorced, separated, widowed	-0.055	<.0001	-0.074	<.0001	-0.052	<.0001
Children	0.047	<.0001	0.046	<.0001	0.040	<.0001
Increasing education level	-0.070	<.0001	-0.050	<.0001	-0.073	<.0001
Employment status						
Unemployed	-0.114	<.0001	-0.105	<.0001	-0.114	<.0001
Retired	0.058	<.0001	0.040	<.0001	0.052	<.0001
Increasing income status	-0.128	<.0001	-0.114	<.0001	-0.128	<.0001
Heavy alcohol consumption	0.035	<.0001	0.045	<.0001	0.034	<.0001
Declining general health status	0.205	<.0001	0.199	<.0001	0.210	<.0001
Increasing frequency of poor physical health days	0.244	<.0001	0.245	<.0001	0.246	<.0001
Use of disability equipment	-0.069	<.0001	-0.103	<.0001	-0.066	<.0001
Declining emotional support	0.201	<.0001	0.157	<.0001	0.210	<.0001
Declining life satisfaction	0.318	<.0001	0.303	<.0001	0.320	<.0001

*Pearson correlation coefficient

Table 6: Adjusted multiple linear regression model of predictor variables on days of poor mental health, BRFSS 2006

	Total Sample (n = 264,154)		Veterans (n = 38,691)		Non-Veterans (n = 225,463)	
	Adjusted		Adjusted		Adjusted	
	Beta	Pr > t	Beta	Pr > t	Beta	Pr > t
Intercept	-0.925	<.0001	0.368	0.5083	-1.049	<.0001
Non-veteran status	0.323	0.0002				
Age	-0.055	<.0001	-0.047	<.0001	-0.057	<.0001
Male gender	-1.234	<.0001	-1.069	0.003	-1.242	<.0001
Race						
Black Non-Hispanic	-0.523	<.0001	-0.650	0.0059	-0.532	<.0001
Hispanic	-0.734	<.0001			-0.818	<.0001
Other Race or Multiracial					-0.280	0.0381
Marital status						
Never married						
Divorced, separated, widowed	0.388	<.0001			0.427	<.0001
Children						
Education level						
Employment status						
Unemployed	1.469	<.0001	1.756	0.0218	1.418	<.0001
Retired						
Income						
Healthy alcohol consumption	-1.104	<.0001	-1.115	<.0001	-1.109	<.0001
Declining general health status	0.496	<.0001	0.383	<.0001	0.514	<.0001
Increasing frequency of poor physical health days	0.184	<.0001	0.130	<.0001	0.195	<.0001
Use of disability equipment			0.886	0.0013		
Declining emotional support	0.655	<.0001	0.518	<.0001	0.686	<.0001
Declining life satisfaction	2.498	<.0001	2.030	<.0001	2.563	<.0001
	R ² = 0.1703		R ² = 0.1454		R ² = 0.1734	

*Never married marital status, presence of children in home, income, education level, and retired employment status removed from model when determined to be insignificant in preliminary analysis.

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